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JOSEPH S. TRIPOLI
PATENT OPERATIONS
THOMSON LICENSING INC.
P.O. BOX 5312
PRINCETON, NJ 08543-5312

EXAMINER

CZEKAJ, DAVID J

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PAPER

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEAN-YVES BABONNEAU, JACKY
DIEUMEGARD, and OLIVIER LE MEUR

Appeal 2011-005511
Application 11/062,516
Technology Center 2400

Before GLENN J. PERRY, JEREMY J. CURCURI, and
DAVID C. McKONE, *Administrative Patent Judges*.

CURCURI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1 and 3-12. App. Br. 2. Claim 2 is canceled. App. Br. Claim Appendix; Ans. 2. We have jurisdiction under 35 U.S.C. § 6(b).

Claims 1 and 8-12 are rejected under 35 U.S.C. § 103(a) as obvious over Linzer (US 5,905,542; issued May 18, 1999) and Lee (US 5,731,836; issued Mar. 24, 1998). Ans. 3-4.

Claims 3-7 are rejected under 35 U.S.C. § 103(a) as obvious over Linzer, Lee, and Ducloux (US 6,148,107; issued Nov. 14, 2000). Ans. 5-6. We affirm.

STATEMENT OF THE CASE

Appellants' invention relates to "preprocessing prior to coding of a sequence of video images." Spec. 1:5-6. Claim 1 is illustrative and reproduced below:

1. Device for preprocessing prior to coding of a sequence of images comprising
means of estimation of motion, for each pixel of a current frame, between a current pixel and a corresponding pixel of a previous frame and of a previous frame of same parity as the current frame,
wherein it comprises
means of performing a morphological processing on the pixels of the current frame with the aid of a structuring element made up of pixels,
means of defining the pixels composing said structuring element as a function of the motion estimation carried out on the current pixel.

ANALYSIS

THE OBVIOUSNESS REJECTION OF CLAIMS 1 AND 8-12 OVER LINZER AND LEE

Claims 1, 8, 10, and 11

The Examiner finds Linzer and Lee collectively teach all limitations of claim 1. Ans. 3-4 (citing Linzer, col. 1, ll. 6-9; col. 4, ll. 1-24; Lee, col. 2, ll. 1-10; col. 8, ll. 18-28; FIGS. 4-5). The Examiner further explains

Lee discloses in column 8, lines 15-28, performing morphological filtering, or processing, on the pixels. This processing is controlled according [to] the sizes of the structuring elements of the signals. Lee further discloses in

column 7, lines 1-15, the specifics of the structuring element. Since, at the output of the morphological filter, a motion vector is selected, the morphological filter, or processing, is part of the motion estimation system. Hence, the pixels are defined as a function of the motion estimation. Therefore, Lee discloses performing morphological processing on the pixels of the frame with the aid of a structuring element and defining the pixels composing the element as a function of motion estimation carried out on the pixel.

Ans. 6.

Appellants present the following principal arguments:

(i) Linzer and Lee do not teach or suggest defining the pixels composing the structuring element as a function of the motion estimation carried out on the current pixel. App. Br. 9; Reply Br. 6.

(ii) Linzer and Lee do not teach performing a morphological processing on the pixels of the current frame with the aid of a structuring element made up of pixels. App. Br. 12; Reply Br. 6.

(iii)

Figure 4 of Lee does not show a link between the motion estimator component 52 and the filter 61. The morphological processing of Lee is operated in filter 61. Filter 61 filters off the accumulated errors while preserving the edges within the motion-compensated image on the reconstructed previous frame and then transmits the filtered motion-compensated image into the subtractor 53 (column 6, lines 23-27). Filter 61 does not make use of the output of the motion estimator, i.e. the motion vectors. Filter 61 filters the motion-compensated image generated from the motion compensator and operates at a completely different timeframe during the process than by motion estimation component 52.

Reply Br. 6-7.

(iv)

[T]he only reference made in Lee with respect to structuring elements is the size of the structuring element which is said to vary with the dimension of the signal being processed. In addition, in col. 7 line 67 to col. 8 line 2, Lee refers to the size of the structuring element and not how this structuring element is defined. Stating that the size of the structuring elements varies is not equivalent to “defining the pixels composing said structuring element as a function of the motion estimation carried out on the current pixel,” as in the present claimed arrangement.

Reply Br. 7.

We are not persuaded of error.

Lee’s FIG. 4 describes “a simplified block diagram of a[n] encoder.”

Lee, col. 5, l. 41.

Lee’s FIG. 5 describes “a flow chart for explaining the operation of the filter shown in FIG. 4.” Lee, col. 5, ll. 43-44.

Lee (col. 7, ll. 7-12) describes

Signals **151** and **159** [in FIG. 5] indicate the sizes of structuring elements. A structuring element is a window of a general filter. If the size of the structuring element is k , the output signal value at the (i) th position is determined by the input signal values at the $(i-k)$ th to $(i+k)$ th positions.

Lee (col. 8, ll. 15-25) describes

The image simplifying method by morphological filtering according to the present invention can be applied to pre- and post-processing of a video signal.

As described above, the image simplifying method by morphological filtering according to the present invention has the following advantages: (1) in contrast to the prior art, peaks in both directions can be removed and important edge information can be retained, simultaneously; (2) the degree of simplification can be controlled according to the sizes of the structuring elements of the signals **151** and **159** shown in FIG. **5**.

Lee describes the recited defining the pixels composing the structuring element as a function of the motion estimation carried out on the current pixel. (Lee's motion compensator and frame memory block 60 in FIG. 4, via signals 151 and 159 (FIG. 5) provided to filter 61, defines pixels composing the structuring element. Block 60 receives input from motion estimator block 52, and provides output to filter 61. *See* Lee, FIGS. 4 and 5, col. 7, ll. 7-12.)

Lee also describes the recited performing a morphological processing on the pixels of the current frame with the aid of a structuring element made up of pixels. (Lee's filter 61 performs the morphological processing as recited. *See* Lee, FIGS. 4 and 5, col. 8, ll. 15-25.)

Regarding Appellants' arguments (i) and (ii), we find these arguments unpersuasive because Lee teaches the argued limitations as explained above.

Regarding Appellants' argument (iii), we also find this argument unpersuasive. Lee's filter 61 performs morphological processing with the aid of a structuring element (signals 151 and 159 (FIG. 5)) as recited. Notably, Lee (FIG. 5) depicts blocks for "erosion" and "dilation" within filter 61.

Regarding Appellants' argument (iv), we also find this argument unpersuasive. As noted above, Lee's motion compensator and frame memory block 60 in FIG. 4, via signals 151 and 159 (FIG. 5) provided to filter 61, define pixels composing the structuring element. Block 60 receives input from motion estimator block 52, and provides output to filter 61. *See* Lee, FIGS. 4 and 5, col. 7, ll. 7-12.

We, therefore, sustain the Examiner's rejection of claim 1, and of claims 8, 10, and 11, which are not argued separately with particularity.

Claims 9 and 12

Regarding claims 9 and 12, Appellants present the same arguments as presented for claim 1. *See* App. Br. 14-18; Reply Br. 8-9.

For reasons discussed above with respect to claim 1, we are not persuaded of error.

We, therefore, sustain the Examiner's rejection of claims 9 and 12.

THE OBVIOUSNESS REJECTION OF CLAIMS 3-7
OVER LINZER, LEE, AND DUCLOUX

Regarding claims 3-7, Appellants present the same arguments as presented for claim 1. *See* App. Br. 19-23; Reply Br. 10.

For reasons discussed above with respect to claim 1, we are not persuaded of error.

We, therefore, sustain the Examiner's rejection of claims 3-7.

ORDER

The Examiner's decision rejecting claims 1 and 3-12 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

gvw